

[C. E. C. Fischer in a note on this species (*J. Bombay nat. Hist. Soc.* 18 : 207) stated that he had no evidence of these spiders attacking any insects struggling in the web and believed that they either allowed the trapped insects to die or waited till it was quite helpless with starvation.—EDS.]

### 23. AN UNUSUAL METHOD OF CURING SCORPION STINGS

My attention has been drawn to a note in *The Times* of the 13th June 1960 (late London air edition) entitled 'An Indian Painkiller'. When the correspondent, probably an ex-I.C.S. man, was sitting with one Agarwal, a Dy. Magistrate in Saharanpur, he was stung by a brown wasp. Agarwal offered to cure him with a none too clean steel-bladed paper-knife and the correspondent hesitatingly agreed. With the knife point held flat under his forefinger, Agarwal criss-crossed slowly and steadily the area of the sting, firmly scratching but never breaking the surface. Each time he was careful to ensure that the knife point crossed the exact point of entry of the sting and with each stroke the correspondent felt relieved. After a dozen passes or so, the pain had virtually disappeared. Subsequently, the correspondent used this cure successfully for scorpion and wasp stings. He also mentions an instance when his treatment was interrupted by a Sub-inspector of Police who, by similar methods, 'put back' the pain! This was however removed a few minutes later in the same fashion and one is left with the impression that the pain could be 'switched' on and off!

This reminds me of a similar experience.

About 30 years ago a cousin F. H. B. Tyabji started farming near Ahmednagar in the Bombay-Deccan. The area was a wilderness and very little medical attention was then available. Under these circumstances my cousin, with a bottle of iodine and a few standard mixtures, soon became the local doctor. Among the many complaints of various kinds which were brought to him, he found that scorpion sting was a constant occurrence. About this time, he was informed that certain signs accompanied by verses from the Koran would cure the pain and he decided to give it a trial.

A rectangle was to be drawn complete with diagonals and a triangle at the top, without lifting the instrument off the skin, the Arabic lines being recited throughout the performance.

The response was instantaneous and amazing. At the first performance the pain was said to have dropped for an appreciable distance and, if repeated two or three times, disappeared completely. A person literally writhing with pain would turn up at the farm to be treated and return happy and cured within a few minutes. Tyabji's fame spread far and wide and victims crowded to him for the 'miraculous' cure. With more experience he noticed that the designs did not have to be very carefully drawn and that he could skip portions of the prayer. Later, he would merely make passes with his hands and omit the recitations, but the cure worked just the same. I understand that he treated hundreds of cases and failures to relieve pain were very rare.

This is not all and I have an experience of my own to relate which occurred in 1948, at Chikalda. Returning from a morning's walk, I found the khansama in great agony, having been stung on the hand by a scorpion and the pain having gone up to his shoulder. On the table lay a scalpel, which I had been using for skinning birds. I picked it up and seized the victim's arm. Fearing, perhaps, some sort of amputation, the khansama shrank from me, but I merely made some passes over his shoulder, barely touching the skin. My inquiry regarding the efficacy of the cure was met by a blank stare, but I repeated my actions and was told that the pain had dropped to the elbow. A few more passes had the man completely cured, except for slight discomfort at the initial puncture. My wife was present and I do not know which of us three was the most surprised at what had happened.

I have not had another opportunity to try out this cure, but am surprised that it is not better known and has not been more closely investigated by the medical profession. I have no explanation to offer.

BOMBAY NATURAL HISTORY SOCIETY,  
91, WALKESHWAR ROAD,  
BOMBAY 6,  
August 1, 1960.

HUMAYUN ABDULALI

[Fr. H. Santapau, Joint Editor, writes:

'The late Rev. J. F. Caius, Vice-President and member of the editorial board of the Bombay Natural History Society, jointly with Dr. M. S. Mhaskar published a lengthy paper on 'Notes on Indian Scorpions' in the *Indian Med. Res. Mem.* 24 : 1-102, 1932. In the preparation of the paper, the authors studied a very large number of herbal preparations commonly used in India in the treatment of

scorpion sting. Of these preparations Caius and Mhaskar write: 'None of the Indian Plant Remedies popularly used in the treatment of scorpion sting has been found to have any preventive, antidotal, or therapeutic effect'.

'I asked Fr. Caius what then could be done for scorpion stings. His answer confirmed the facts mentioned by Shri H. Abdulali in the preceding note. The most acute pain is felt in the nerve ganglia in the upper arm or upper leg. Fr. Caius informed me that, using a needle or even a pointed pencil, one should make a series of scratches (without cutting the skin) beginning from the point of greatest pain; from there the scratches are to be repeated about every inch downwards to the tip of the fingers or of the toes. The scratching of the skin distracts the attention of the sufferer, so that by the time the last scratch has been made near the tip of the arm or leg, the pain has disappeared.

'In my personal experience I have found that alcohol or methylated spirit, ammonia, or even kerosene oil applied to the hand or foot and allowed to evaporate may produce the same pain-killing effects.

'One thing should be kept in mind when stung by a scorpion. 'Scorpion sting is very rarely fatal; and thus scorpions are no more dangerous to human beings than bees or wasps.' (Caius & Mhaskar, p. 98). Some of the deaths recorded in the past as due to scorpion sting are in all probability mostly due to the vivid imagination of the sufferer. The maximum amount of venom found by Caius and Mhaskar in the common Indian scorpion, *Buthus tamulus*, was only 5.3 mg.; if the toxicity of the venom in relation to body weight was the same for man as for the very susceptible English rabbit, the total quantity mentioned above would not be lethal for a greater body-weight than 2.6 kg. Scorpion venom should then not be lethal to man, children not excepted'.—Eds.]

#### 24. A NEW SPECIES OF MOLLUSC, *GULELLA* *RAMBHAENSIS*, FROM RAMBHA IN ORISSA (GASTROPODA: FAMILY STREPTAXIDAE)<sup>1</sup>

(With one text-figure)

*Gulella* (*Huttonella*) *rambhaensis* sp. nov.

*Material*: One broken land shell found along with other specimens in debris lying on the beach of Rambha Bay of the Chilka

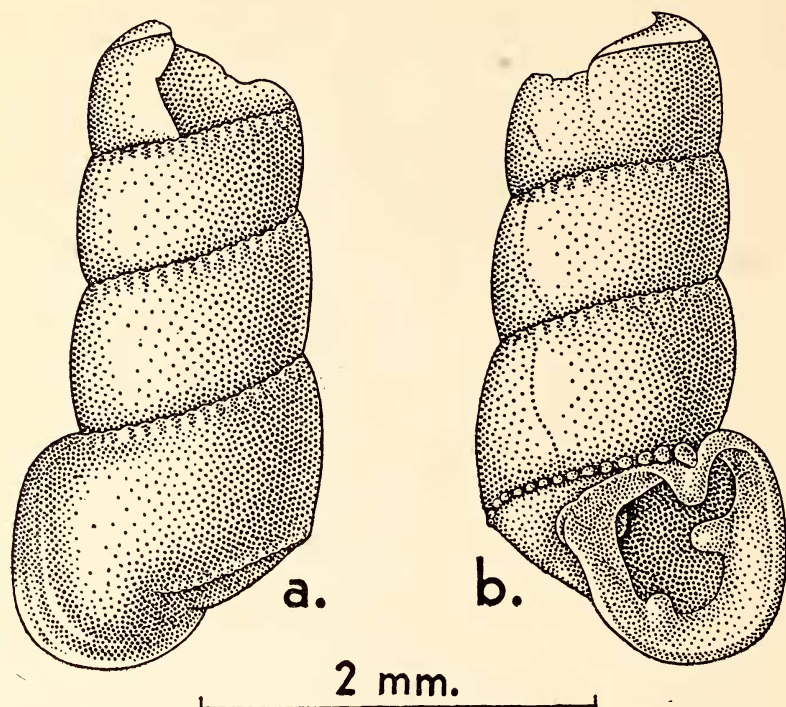
<sup>1</sup> Communicated by the Director, Zoological Survey of India, Calcutta.

Lake, Ganjam District, Orissa, about 0.4 km. west of Rambha Dak Bungalow and 4.8 metres above the water margin.

Though the spire is only partly broken, other essential parts which remained intact, such as bodywhorl, penultimate whorl, peristome and armature of the mouth, show the characteristic features of the genus *Gulella* Pfeiffer (1856). Besides, further study reveals such remarkable features as are seldom met with in any known species of this genus. Hence, I propose for it the new name *rambhaensis*.

*Diagnosis:* Shell tiny, fragile, perforate, cylindrically-turreted, dextral, smooth, polished but not shining, white (but it seems that the colour was pale cream when fresh), devoid of costulations; spire partly broken, but much narrower than in *G. bicolor* and its var. *barkudensis*; whorls only 4 (the rest, possibly 3 or 4, being entirely lost with the broken upper part of the shell), slightly convex, body-whorl adnate as in the above two (i.e. closely connected with the penultimate whorl, though not free), larger and produced outwards, greater in width than in length, distinctly carinate at the base—the carina ending a little before the extremity marked with 2 or 3 vertical lines of growth; sutures impressed and crenulate—crenulations appearing more prominent and bead-like on the ventral side of the last suture, but gradually diminishing in size while passing round the dorsum of the bodywhorl along the carina, and ultimately terminating with it at the base; peristome white, thickened, expanded, continuous, reflected, rounded at the base somewhat as in var. *barkudensis*, truncated above, outer margin more regularly curved and expanded in the absence of external fosset, and hence extending even beyond the general outline of the body of the shell itself; parietal lamina prominent and looking somewhat like the upper part of the human ear, and ascending just above the last suture only; actual orifice trilobed—the largest lobe median and lying on the columellar side, in between the parietal tooth above and the basal tooth at the left corner below, with the other two on the outer side, the smallest lobe lying above at the upper angle and the intermediate lobe at the lower angle in between the median outer marginal tooth (or palatal tooth) and the basal tooth; parietal and palatal teeth appearing more or less equally strong, basal tooth smaller and less strong than both, but columellar plica smallest of all, deep-seated, somewhat depressed and lying just behind the largest lobe on the throat of the columella; umbilicus only slit-like and concealed from view by the expanded peristome and hence should be carefully seen from a profile view.





Shell of *Gulella* (*Huttonella*) *ramkhaensis* sp. nov., from Rambha, Orissa  
(a) Dorsal view; (b) Ventral view.

*Measurements:*

(i) Length of the broken shell	...	...	3.2 mm.
(ii) Diameter of the broken shell (round the penultimate whorl)	..	...	1.3 mm.
(iii) Length of the bodywhorl	...	...	1.2 mm.
(iv) Diameter of the bodywhorl	...	...	1.7 mm.
(v) Length of the peristome	...	...	1.0 mm.
(vi) Diameter of the peristome	...	...	1.0 mm.
(vii) Length of the actual orifice	...	...	0.8 mm.
(viii) Diameter of the actual orifice	...	...	0.5 mm.

*Type specimen:* Holotype. Regd. No. M 16593/2, Zoological Survey of India, Calcutta.

*Type locality:* Beach of Rambha Bay of the Chilka Lake at Rambha, Ganjam District, Orissa. Coll. Dr. H. C. Ray. 6-1-55.

*Remarks:* The new species, *G. (H.) ramkhaensis*, may be closely allied to *G. bicolor* (Hutton, 1834), the most widely distributed land snail originally known from Mirzapur, U.P., and its var. *barkudensis* (Annandale & Prashad, 1920) from the Barkuda Island in Chilka

Lake, Orissa, but differs markedly from both in having the shell perforate and its spire much narrower, bodywhorl slightly more produced outwards and carinate at the base, crenulations more prominent and bead-like on the ventral side of the last suture and continued even to the base along the carina, peristome continuous and its outer margin regularly curved and more extended outwards in the absence of external fosset. For further details about *G. bicolor*, the papers of Benthem Jutting (1950) and Blanford & Godwin-Austen (1908) may be consulted.

ZOOLOGICAL SURVEY OF INDIA,  
34, CHITTARANJAN AVENUE,  
CALCUTTA-12,  
September 14, 1960.

H. C. RAY,  
M.Sc., D.Phil., F.Z.S.I.

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*Rec. Ind. Mus.* 19(5): 189-191 (*E. bicolor*), 191-194 (var. *barkudensis*).  
 Benthem Jutting, W. S. S. (1950): Pfeiffer, L. (1856): *Malakozool. Blatt.* 2: 173 (*Gulella*), 174 (*Huttonella* and species *bicolor*).  
 Blanford, W. T. & Godwin-Austen, H. H. (1908): *Fauna Brit. Ind.*, Moll.

## 25. ECTOPROCTAN-COELENTERATE ASSOCIATION: AN EXAMPLE OF UNPURPOSEFUL INQUILINISM?

While examining a catch of fishes for parasites I came across a specimen of the crustacean cymothoid isopod, *Nerocila trivittata* Bleeker, attached to the dorsal side of the fish *Otolithus argenteus*. The posterior part of the body of the parasite appeared to be covered with foreign matter which, on repeated washing, did not peel off. Consequently the specimen was examined under the microscope. What looked like dirt turned out to be an encrustation of the coelenterate hydroid, *Clytia gracilis*, with a close matting of an ectoproctan, amidst the horizontal stolons.

As observed by Dales (*Geological Society of America*, Mem. 67, p. 391, 1951) interpretation of commensalic associations is peculiarly susceptible to anthropomorphic bias, particularly because of the difficulty of applying experimental methods to determine the degree of dependence of the commensals. Hence exceptions, like the present, have importance.

Associations between animals and plants or between animals of widely different groups are described, often casually, as mutualism (symbiosis), commensalism, and inquilinism. Many sedentary animals,

particularly hydroids and polyzoans, are epizoid on, i.e. they live attached to, other animals or plants, but are not parasites on them. There are records of hydroids growing on other coelenterates, polychaetes, decapods, molluscs, and fishes (Dales, op. cit.). The present record adds another, quite an unconventional one, to the list of hosts. To my knowledge a parasitic isopod has not previously been known as the host of a commensalic hydroid or ectoproctan. But the parasitic copepod, *Sarcotretes scopeli*, has been recorded harbouring the hydroid, *Ichthyocodium sarcotretis* (Jungerson, *Vidensk. Meddel. naturh. Foren.* Vol. 64, 1911). Hence, it is interesting to speculate on the origin of the association.

Many of these associations have their origin in the crowded condition of the littoral and sublittoral zones. Also, in muddy or sandy areas the only hard objects available to sedentary animals are other animals. Here competition is mainly for living space, to secure a foothold. Epizoids get attached, at random, to any solid substratum, motile or sedentary. Hence, all associations, even the most specific ones, must have originated quite accidentally. Specificity is the result of natural selection.

*Nerocila* has a short free-swimming existence during its male phase, but soon contacts a suitable host and metamorphoses into a female. As the fish in question is neither littoral nor sublittoral in the strict sense, the association must have started in the pelagic environment. It is well known that larvae of most sedentary organisms have a definite larval period, at the end of which they must settle or perish. In the present case the hydroid larva, compelled by necessity settled on the isopod. It has to be admitted that the isopod host is certainly more suitable than a sedentary animal or an inanimate object, as the hydroid would certainly benefit by the movement of the fish host and also get the advantage of a sedentary life. Obviously the ectoproctan is the latest guest, for usually nothing settles over a live ectoproctan colony. It is likely that the encrusting hydrorhizae of the coelenterate provided the necessary purchase for the polyzoan.

The present discovery shows that any hard surface is utilised by the larvae of sedentary organisms and the choice is solely dependent on the exigencies of circumstances. The present example should be classed as fortuitous association or 'unpurposeful inquilinism'.

MARINE BIOLOGICAL LABORATORY,  
TRIVANDRUM,  
July 19, 1960.

N. KRIŚHNA PILLAI

## 26. THE CORRECT NAME OF *CASSIA GLAUCA* AND ITS VARIETIES

The plant, commonly known in India as *Cassia glauca*, is a shrub or a small tree with attractive yellow or orange flowers. This plant drew the attention of some of the pioneer botanists who worked on Indian plants in the seventeenth and eighteenth centuries. Rheede (1686) described this plant under the name *Wellia-tagera* and gave two good illustrations. Burman (1768) described the plant and named it *Cassia surattensis*. The plant was described as having eight pairs of leaflets with obtuse apices and bright orange-coloured flowers. The description of the plant was based on a specimen from Garzin's herbarium and probably for this reason no reference to Rheede's *Wellia-tagera* was given. A few years later, Lamarck (1789) described the plant as *Cassia glauca*, and Vahl (1794) named it *Cassia arborescens*. Both Lamarck and Vahl have referred to Rheede's description and plate. Burman's name, *Cassia surattensis*, being earlier and conspecific with *Cassia glauca* and *Cassia arborescens*, must be accepted as the valid name for this plant. Bentham (1871), in his revision of the genus *Cassia*, agreed that all these names refer to the same species, but somehow he accepted the name *Cassia glauca*. Merrill (1923), however, indicated that the name *Cassia surattensis* should receive priority over *Cassia glauca*. In recent publications of Raizada & Hingorani (1954), the name *Cassia surattensis* has been accepted.

It would have been unnecessary to prepare this note if there was unanimity of opinion on the lines suggested above. But unfortunately, it is not so. Bailey (1949) considered that *Cassia planisiliqua*, which was published much earlier by Linnaeus himself, should be the valid name of this plant. He supported this with two earlier publications by Grisebach (1864) and by Britton & Rose (1930). The latter authors not only considered *Cassia glauca* the same as *Cassia planisiliqua*, but further decided to place the plant under a newly created genus which they named *Psilorhegma* and the plant was named *Psilorhegma planisiliqua* (Linn.) Britt. & Rose. The new genus was apparently created in view of such characters as ten perfect stamens in flowers, flat pods, and glanduliferous leaves. It was however felt that in general appearance the plant agrees very well with *Cassia* and the creation of the new genus (and thereby removing the plant from the genus *Cassia*) is a step which is rather



artificial. As a matter of fact, Bailey (1949) has correctly restored *Psilorhegma* back to *Cassia*, which should be its natural and rightful place.

After a study of the available literature, it is clear that the name *Cassia planisiliqua* as accepted by Bailey cannot be considered for this plant. According to Bentham (1871), who examined the specimen of *Cassia planisiliqua* at the Linnean Herbarium and the original plates of Plumier on which the description was mainly based, the name *Cassia planisiliqua* is to be regarded as a *nomen confusum*. The Linnean diagnosis of the species given in his SPECIES PLANTARUM refers to *Cassia occidentalis*. The plate referred to by Linnaeus (i.e. Plumier ed. Burm. t. 77) is unfortunately a mixture of two or three species and does not refer at all to any known species of *Cassia*. According to Bentham: 'The leaves are those of *Cassia fistula*, the flowers quite unintelligible, the fruit more like that of section *fistula* than of any other, described as flat, whence the name, but figured as nearly terete and filled with a series of unintelligible circles described as *ossicles* or seeds, but more likely to be the transverse septa of the *fistula* section as they overlap each other. The whole species must, therefore, be passed over as an inexplicable puzzle, founded on the diagnosis of one species, with the representation of another, cooked up by an inaccurate artist, and encumbered by the description of the fruit of a third species. The plant representing *C. planisiliqua* in the Linnean Herbarium is *C. siamea*, which is certainly not the one from which he took his diagnosis.'

It would, therefore, be clear that the evidence against accepting the name *Cassia planisiliqua* is overwhelming and this name has to be rejected from our consideration. We have, therefore, to accept the next validly published name, *Cassia surattensis* Burm. f., as the name for this plant. The species has two well-marked varieties, i.e. (i) var. *surrattensis* and (ii) var. *suffruticosa*. These two varieties were considered by some as distinct species. Bentham (1871, p. 555), on the other hand, found it difficult to separate the Indian collection into two distinct varieties. He has, however, admitted the existence of two 'types' as he said: 'The Australian specimens belong to the *suffruticosa* type; they are much more variable than the Indian ones, but not in the direction of the large *glauca* type.' From an examination of herbarium specimens, these two 'types' are clearly distinguishable and should be considered as two varieties. Important points of difference between the two varieties are the presence of more numerous and smaller leaflets and strongly unequal petals in



var. *suffruticosa*. The nomenclature and descriptions of these varieties with their distribution are as follows:

(i) **Cassia surattensis** Burm. f. var. **surattensis**. *Cassia surattensis* Burm. f. Fl. Ind. 97 (1768). *C. glauca* Lam. Encycl. 1: 647 (1789). *C. arborescens* Vahl (non Mill.) Symb. Bot. 3: 56 (1794). *C. discolor* Desv. Journ. Bot. 3: 73 (1814). *C. sulphurea* DC. Prodr. 2: 495 (1825). *Senna arborescens* Roxb. Fl. Ind. 2: 345 (1832).

A small tree 5 to 6.5 m.; young branches minutely pubescent becoming glabrous later; stipules subulate, acuminate, 1 cm. long; petiole 2 to 5.5 cm. long, glabrescent; rachis thinly pubescent or glabrous, with 2 or 3 short, stout, clavate glands in between lower pairs of leaflets (one gland between each lower pair); leaves equally pinnate, 15 to 22 cm. long; leaflets 4 to 6 pairs, elliptic or oblong-elliptic, ovate, entire, subacute, pinnate-reticulate veined, almost glabrous, glaucous beneath, 5-10 cm. long, 2.5-4 cm. wide; peduncles axillary, 6 to 10 cm. long; pedicels 2-3 cm. long; flowers corymbose, sepals ovate or elliptic, rounded, unequal, 8 to 10 mm.; petals 5, subequal, spreading, broadly ovate-obtuse, 2 to 3 cm. long, bright yellow-orange; stamens 10, anthers all equal and fertile, two with longer filaments; pods flat, straight, drooping, glabrous, 10 to 17 cm. long, 1.5 cm. wide, margin raised; seeds biseriate 20 to 30, oval, testa dark brown.

*Distribution:* India, Burma, Ceylon, Malaya, southern China, Formosa, Sumatra, tropical Australia. Cultivated also in many countries.

(ii) **Cassia surattensis** Burm. f. var. **suffruticosa** (Koen. ex Roth) Chatterjee comb. nov. *C. speciosa* Roxb. Hort. Beng. 31 (1814) nomen. *C. suffruticosa* Koen. ex Roth, Nov. Pl. Sp. 213 (1821); Koen. ex Roth in DC. Prodr. 2: 496 (1825); W. & A. Prod. 289 (1834); Benth. Fl. Austral. 2: 285 (1864). *C. horsfieldii* Miq. Fl. Ind. Bat. 1: 99 (1855). *Senna speciosa* Roxb. Fl. Ind. 2: 347 (1832). *Cassia acclinis* F. Muell. Fragm. 4: 13 (1864). *C. glauca* Lam. var. *suffruticosa* (Koen.) Baker in Hook. f. Fl. Brit. Ind. 2: 265 (1878). *Psilorhegma suffruticosa* (Koen.) Britton in North Am. Fl. 23: 255 (1930).

*Cassia fastigiata* Vahl (Symb. Bot. 3. 57, 1794) excl. descr. 'glandulis inter omnia paria' probably belongs here as indicated by Wight and Arnott (*Prod.* 290, 1834) and Prain (*J. As. Soc. Bengal* 66: 477, 1897).

The varietal name *Cassia glauca* Lam. var. *suffruticosa* (Koen.) Baker (Hook. f. Fl. Brit. Ind. 2: 265, 1878) appears to be wrongly

ascribed to Prain in Gamble's Flora of Madras (403, 1919) instead of to Baker.

It may be of interest to note that Fischer (*Kew Bull.* 1932: 56) examined Koenig's specimens from India now kept at the Lund Herbarium but did not find any specimen of *Cassia surattensis* or *Cassia glauca*.

A tall shrub or a small tree; young branches adpressedly pubescent, older twigs glabrous; stipules subulate, 1 cm. long; petioles 2 to 3 cm. long, glabrescent; rachis thinly pubescent with 2 or 3, erect, clavate glands, located on the lower part of rachis (one gland in between each pair of leaflets); leaflets 6 to 10 pairs, obovate oblong, obtuse or rounded, finely pinnate-reticulate, 2 to 4.5 cm. long, 1 to 1.5 cm. wide, upper surface glabrous, lower glaucous minutely pubescent; peduncles axillary, 2 to 6 cm. long; inflorescence corymbose; pedicels about 2 cm. long; sepals 7 mm., elliptic; petals 1.5 to 2 cm. long, distinctly unequal; stamens 10, all equal and perfect, lower two on longer filaments; pods 6 to 10 cm. long, 8 to 12 mm. wide, glabrescent, margin raised.

*Distribution:* India, Burma, Malaya, Java, Australia. Cultivated in many countries.

INDIAN BOTANIC GARDEN,

CALCUTTA,

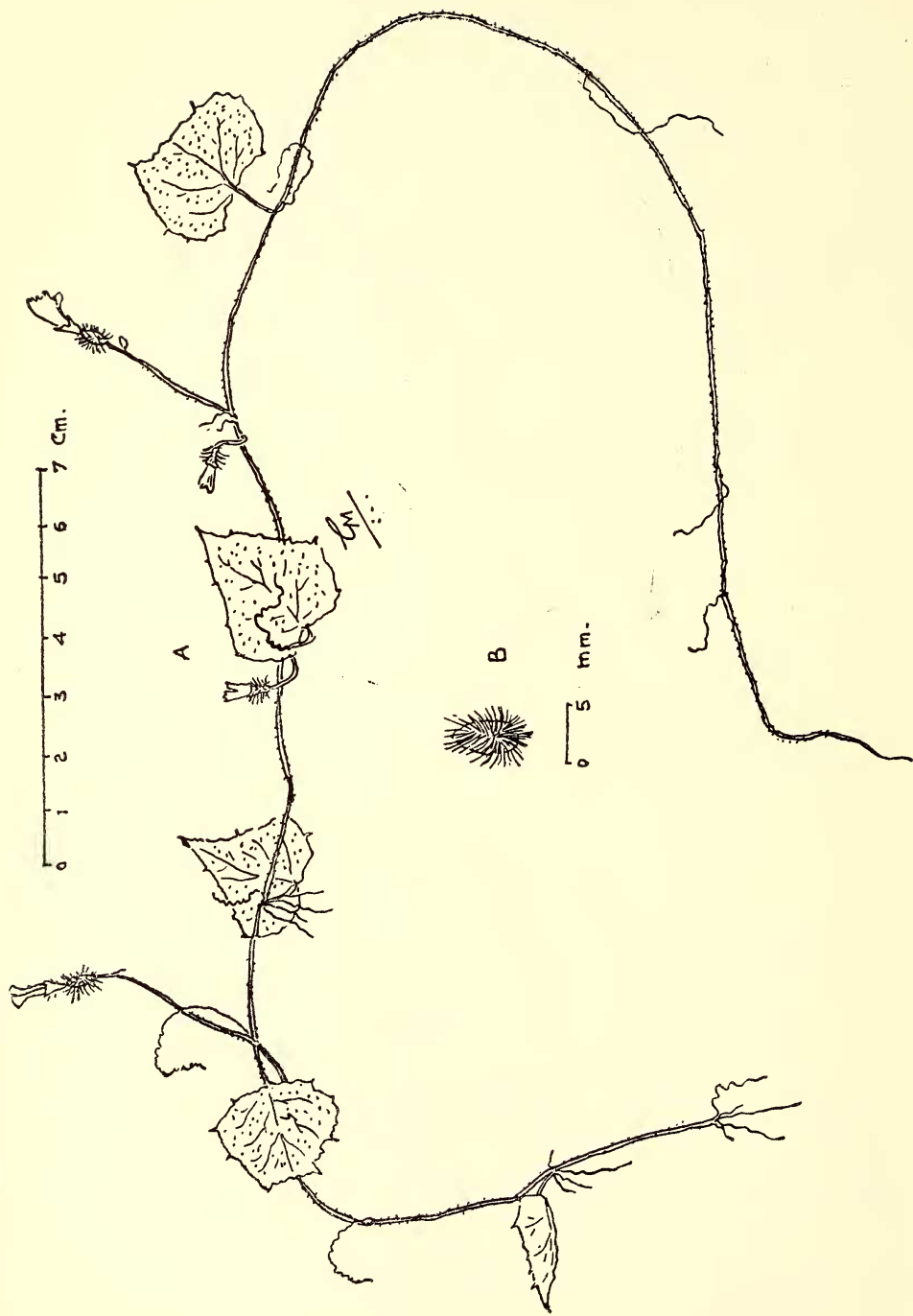
August 19, 1960.

D. CHATTERJEE

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*Cucumis setosus* Cogn.  
A. Flowering branch; B. Fruit.

27. *CUCUMIS SETOSUS* COGN.—A NEW RECORD  
FOR BOMBAY

(With one plate)

In our exploration of Pavagadh Hill, 46.6 km. NE. of Baroda, we have come across a cucurbit which is not described in our common floras. Chakravarty (1959) in his recent monograph on the Indian Cucurbitaceae describes this plant. A few notes on the distribution of the same are interesting.

*Cucumis setosus* Cogn. in DC. Monog. Phan. 3: 491. 1881; Chakravarty, Mon. Ind. Cucur. 106, f. 44, A-D & f. 45, map 51, 1959.

A slender climber, monoecious. Stem furrowed, clothed with minute coarse hairs. Tendrils slender. Leaves  $2.2-2.4 \times 2.1-2.6$  cm., membranous, deltoid, feeling roughish to the touch, acute, minutely dentate, 3-lobed, 5-nerved, petiole 6-9 mm. long. Flowers small, solitary, yellowish. Calyx tube campanulate, hairy. Corolla glabrous. Ovary globose, oblong; covered with short soft hairs. Fruit setose (covered with bristles).

Flowering and Fruiting: 26th September 1959.

Records from India: (a) Chakravarty lists two specimens for India. 'In Eastern India (Ritchie 321 Herb. Edin.); without precise locality, probably peninsular India (Witt, no. 191 A. 5-D, 25/10/12 Herb. Cal.).' (b) The specimen referred to in the present note was collected by the junior author from Pavagadh, in the forest at an altitude of 461 m. on 26-9-1959, and is preserved in the Herbarium, Department of Botany, M.S. University of Baroda.

*Index Kewensis* gives India as the home of this plant. Chakravarty, loc. cit., mentions only two sheets so far available. Of these two sheets, the one of Ritchie is from eastern India and that of Witt is *probably* from peninsular India without any further details.

The plant seems to be endemic in S. India; it has not been recorded from Bombay. It is, therefore, a new record.

DEPARTMENT OF BOTANY,  
M.S. UNIVERSITY OF BARODA,  
BARODA,  
July 25, 1960.

A. R. CHAVAN  
G. M. OZA



## 28. PHYLLODY OF THE GYNOECIUM AND ANDROECIUM IN YLANG-YLANG TREE, *CANANGA ODORATA* HOOK.

(With a plate)

An interesting occurrence of phyllody of the gynoecium and part of the androecium was observed in some flowers of *Cananga odorata* Hook. from the Victoria Gardens, Bombay, in June 1960. Some of the flowers were normal, showing the typical flower of Annonaceae; in some flowers small leaf-like structures were observed in place of the usual free carpels. Both types of flower were collected from the same plant, which appeared to be quite healthy.

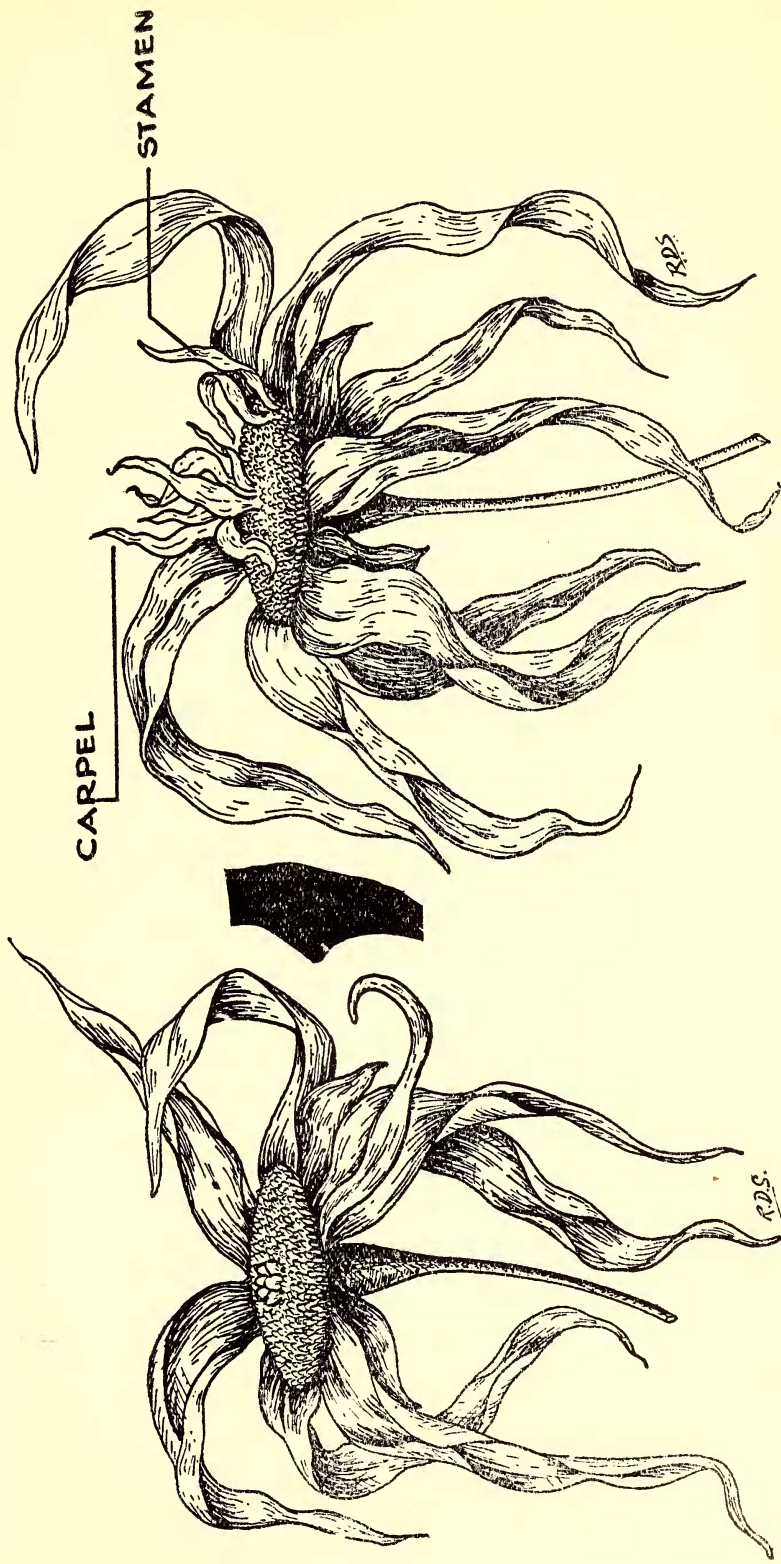
Normal as well as abnormal flowers have a calyx consisting of three sepals, which are green, broad, and gamosepalous. The number of petals in the corolla varies in different flowers; smaller flowers have six petals; in larger flowers the number varies from 6 to 12, the more frequent numbers being 7, 8, 9, or 10. The outer petals are bigger, somewhat linear, with an irregularly wavy margin. The petals appear to be folded or twisted, especially in the upper half.

The androecium consists of more than 100 stamens arranged in 5-6 concentric rows on a very slightly elevated, somewhat flat, thalamus. In many flowers it was observed that one or two stamens of the outermost whorl had been transformed into small leaf-like structures. The odd number of petals found in the flowers may be due to one or more of such transformed petaloid stamens being added to the original six segments of the corolla. In such stamens it seems to be the prolonged connective which has been transformed into a leafy structure.

The gynoecium of the normal flower consists of six carpels in which the ovaries and the styles are free, but the stigmas are loosely connected with each other. In abnormal flowers, however, these free carpels have been transformed into leafy structures of varying sizes. Ovules are not developed in these carpels.

Such transformations of the stamens and carpels are common in plants, especially in the Leguminosae. Cooper has reported transformation of carpels and stamens in *Crotalaria striata* DC.; Trivedi & Nigum have reported similar transformation of the stamens in *Bauhinia acuminata* L.; T. C. N. Singh has recorded phyllody in *Trifolium alexandrinum* L., in which some petals, stamens, and gynoecium have been transformed into leaves of various sizes.

ABNORMAL FLOWER



Phyllody of carpels in *Caranga odorata* Hook.



Recently Mahajan has reported petaloidy of stamens in *Hedychium coronarium* Koenig. Similarly Jayaweera has mentioned petaloid stamens in *Syzygium malacense* Merr. & Perr. From these records it will be noted that phyllody of stamens seems to be more common than phyllody of carpels. The present note is written with the intention of recording phyllody of carpels in *Cananga odorata* Hook., which has so far not been previously mentioned. The fact that this transformation of carpels into leafy structures occurs only in a few flowers in a given plant seems clearly to support the theory that flowers and all their parts are but modified foliage leaves; the facts noted in *Cananga* seem to be but a reversion to ancestral type.

Here we wish to express our gratitude to Rev. H. Santapau, S.J., F.N.I., Director of the Biology Section, St. Xavier's College, Bombay, for critically going through this note and for his suggestions.

BOTANY DEPARTMENT,  
INSTITUTE OF SCIENCE,  
BOMBAY 1,  
August 23, 1960.

(SMT.) K. V. MARATHE  
B. S. NAVALKAR

## REFERENCES

- |  |  |
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| Bailey, L. M. (1949) : Manual of Cultivated Plants. Macmillan Co.                      | Mahajan, M. K. (1957) : <i>Sci. &amp; Cult.</i> 22(8) : 452-454.             |
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|  | Trivedi, B. S. & Nigam, P. N. (1952) : <i>Sci. &amp; Cult.</i> 17(10) : 438. |

## 29. BLACK COLOUR IN FLOWERS: IS THERE SUCH A COLOUR IN NATURE?

In popular literature one often finds references to the black colour of flowers; a correspondent writing in *The Indian Express* of December 2, 1959, mentions that the flowers of the common gram, *Cicer arietinum*, 'grow in four different colours: red, white, yellow, blue or black'.

Sir Robert Robinson (in *Endeavour* 1: 92, 1942) lists the chief groups of vegetable pigments as (a) green chlorophyll and its analogues; (b) yellow and orange carotinoids; (c) miscellaneous pigments such as are found in fungi; (d) yellow anthoxanthins and

orange, red, magenta, violet, and blue anthocyanins. Nowhere in the scientific literature is there any mention of black colour for flowers; there may be, and in fact there are in India, a number of plants that turn black on drying; but there is no such thing as a black-coloured flower in the fresh condition.

We have in Bombay several flowers, wild or cultivated, that may have such a deep brown colour as to appear black; such is the case, e.g. in *Iphigenia indica* of our hills, or some of the cultivated Pansies. The flowers are very deep brown when fresh; none of them is truly black.

Among the parasites of the group of *Striga* (fam. Scrophulariaceae) and other parasites, and in e.g. *Ixora nigricans*, the whole plant becomes black when fully dry. Our tea leaves, or the common tobacco leaves, out of which many of the 'stronger' cigars are made, also turn black; but this is due to faulty drying, that is to say, to fermentation in the process of drying. Botany students often find that their green specimens turn more or less deep black, when sufficient care has not been taken during the drying of the specimens.

In a word, there is no black flower as far as my knowledge goes; there may be such deep brown as to appear black at first sight; there may also be real black colour due to faulty dehydration of some specimens; or there may be an over-all black colour in the case of dry parasitic plants. This is as far as black colour goes in plants.

ST. XAVIER'S COLLEGE,  
BOMBAY,  
December 2, 1959.

H. SANTAPAU, S.J., F.N.I.

### 30. FOOD FROM GRASS MINUS THE COW

Under the above title, the *Daily Telegraph and Morning Post* of London of May 18, 1959, reports on what has been termed a 'mechanical cow', a machine that extracts proteins from grasses and other green plants. It is well known that proteins are essential for human beings and further that a large part of the population of India suffers from malnutrition, especially from protein deficiency. In other parts of the world sufficient proteins can be obtained from meat, fish, eggs, and milk products; but most of these products are either absent from the diet of the average Indian or at least are supplied in much too small quantities to satisfy the needs of the human body.



Proteins found in grass can to a very small extent be extracted by the cow; experimentally it has been found that only about 5% of the proteins in grass are actually extracted by cows. Such proteins are made available to us in meat and milk. But in the present condition of food shortages, it is almost criminal to allow 95% of the proteins in grass to go waste.

The 'mechanical cow' has been set up at Rothamsted Experimental Station; the machine is able to extract at least 50% of the proteins in grass. The Science Correspondent of the *Daily Telegraph* writes on the working of the machine: 'When I saw it this week it was consuming rye. From a normal elevator this was fed into a chopping machine. The chopped rye then entered a press and the juice was squeezed out of it. This juice, which contains the bulk of the protein and hardly any of the cellulose, is then treated with steam: the object being to precipitate the protein. When the protein is precipitated, or made solid, it only requires a filtering process to retain the protein and let all the unwanted juice pass through. Within a very few minutes the 'cow' has produced solid, cake-like protein from green leaves and, what is more important, has collected at least 50 per cent of the protein in the leaves. Moreover, both the juice-less rye choppings and also the waste juice from the filters are still good feeding stuff for animals.'

This is certainly an interesting development. India can ill afford to waste any fodder; under the best conditions, according to the statement made a few years ago by the Director, Animal Husbandry Dept., Govt. of India, the country has enough fodder for scarcely one half of its cattle, if the latter is to be fed properly. The new method does not reduce the quantity of fodder available for cattle, but makes better use of the same.

C/O LLOYDS BANK LTD.,  
39, PICCADILLY,  
LONDON W. 1,  
December 2, 1959.

R. W. BURTON  
Lt.-Col., I.A. (Retd.)

# Gleanings

## Longevity in Wild Birds

The following records of longevity in birds reproduced from page 214 of *The Ring*, Vol. 22, February 1960, may be of interest :

*Numenius arquata*—Curlew : Ringed as a pullet on 4-7-1926 in Sweden, recovered on 25-1-58 in Great Britain, age 31 years 6 months 21 days.

*Milvus milvus*—Kite : Ringed as a pullet on 19-6-30 in Switzerland, recovered on 15-3-1956 in France, age 25 years 8 months 24 days.

## Locusts as a Delicacy

‘ For the first time since we had arrived in the Tassili we saw some flights of locusts. The insects were not very numerous, but they rejoiced the hearts of our Tuareg, who at break of dawn set out to catch the creatures on the trees where they had alighted. It was manna from heaven, for one and all the inhabitants of the Sahara, whether they be Arab, Tuareg or ‘ Moor ’, enjoy a meal of fried locusts.

‘ Matal and Agaoued, who had gone off to see the donkeys grazing, brought back one morning a sackful of locusts which they at once threw living upon hot cinders. A locust, at least to our French palates, is not really what you call a titbit, but for men who are always hungry and whose usual fare is lizards and small rodents, locusts make a very acceptable meal. When a locust is fried or grilled its legs are pulled off (for these are set with prickles), and as much of the wings as has not been consumed by the fire is removed. The head is wrenched off at the same time and the digestive tube extracted for this is quite uneatable on account of the green matter it contains. The rest of the insect is then munched much in the way that we eat shrimps. Sometimes the Tuareg reduce the grilled locusts to powder and place it in skin sacked (*mezwed*) so that it can be eaten, with the addition of water or milk, when the men are travelling.

‘ I myself rather like locusts and at times have eaten nothing else for weeks, but I am free to admit that the taste is not to everyone’s liking. It seems, however, that the really smart thing to do now in the Ourgla oasis—where the oil-men forgather—is to serve grilled locusts (at five francs apiece !) with the *apéritifs*. Maybe a rather expensive bit of snobbery, but one that certainly does provide plenty of local colour.

‘ All the members of the team wanted, of course, to sample the locust. Each one of them gave his opinion. Michel Brézillon thought they tasted like cardboard. Vila compared them with nuts. Lajoux said they reminded him of grass. I maintained they had a savour of shrimps, while Guichard made a grimace and spat out the insect after a vain attempt to swallow it. For him, it was for all the world like excrement.’

Henri Lhote : THE SEARCH FOR THE TASSILI FRESCOES: THE STORY OF THE PREHISTORIC ROCK-PAINTINGS OF THE SAHARA. Translated from the French by Alan Houghton Brodrick. (Hutchinson of London, 1959)

### A New Method of Insect Control

Over the last few years many attempts at insect control have been made in India by the use of DDT and other chemical poisons. Malaria has been eliminated over large areas but many other insects besides mosquitoes have been destroyed at the same time and the consequent ecological changes may lead to untoward results which were not foreseen.

Interest will therefore be felt, not only in India but all over the world, in a revolutionary method of insect control, which has given successful results in the United States. The screw-worm fly (*Callitroga hominivorax*) is found in large areas of the southern states of the Union. The adults lay eggs in open wounds in large and small mammals and the maggots produce conditions which attract more flies and eggs, finally leading to the death of the infected animal unless treated by man.

The U.S. Department of Agriculture and the Florida Livestock Experimental Board raised millions of screw-worm flies under factory conditions, where they were fed on horse and whale meat and then rendered sexually sterile by gamma rays from a Cobalt-60 source. These flies when sexually mature were released over the insect-infested areas (70,000 sq. miles) in Florida from aeroplanes. The behaviour of both males and females was unchanged but the effect upon the population of screw-worm flies was greater than anticipated. Within a year after the initiation of the programme the insect was eradicated, and ‘ not a single screw-worm fly has been seen in the southeastern U.S. for almost two years’. This method has many advantages over the usual control technique. It is effective only on the species concerned. The insects do not acquire immunity to sterile matings as they do to insecticides. In addition to this, when poison is used, it becomes less efficient as the population declines and is left in isolated pockets ; the few survivors can then again build up the population in geometric progression. The sterile male increases the overall effectiveness of the attack and becomes more effective on a restricted population.

Any problem of this kind requires a large amount of preliminary work as well as co-ordinated working at a later stage, but the results are so effective that this method of insect control is superior to any other method of insect control devised so far.

Our information is derived from an excellent article on the eradication of the screw-worm fly by Edward F. Knipling at pages 54-61 of *Scientific American* for October 1960.

## Notes and News

The Thirteenth International Ornithological Congress will be held at Cornell University, Ithaca, New York, U.S.A., from 17 to 21 June 1962. The President is Professor Ernst Mayr.

The International Ornithological Congresses are scientific meetings which have been held at intervals since 1884. Since 1926 a four-year cycle has been maintained except for a twelve-year interruption caused by World War II. The previous Congresses have been held in continental Europe and England.

Persons wishing to receive further announcements, and membership application forms for the Thirteenth International Ornithological Congress should send their names and permanent mailing address to the Secretary-General, Professor C. G. Sibley, Fernow Hall, Cornell University, Ithaca, New York, U.S.A., before 1 February 1962.



ANNUAL REPORT OF THE BOMBAY NATURAL HISTORY  
SOCIETY FOR THE YEAR 1959-60

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Rev. Fr. H. Santapau, S.J.  
Dr. Sálím Ali

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Mr. R. E. Hawkins  
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List of members of the Executive and Advisory Committee elected  
for the year 1960:

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SHRI SRI PRAKASA, *Governor of Bombay*

*Vice-Presidents*

Major-General Sir Sahib Singh Sokhey, I.M.S.  
Rev. Fr. H. Santapau, S.J.

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Mr. F. C. Badhwar, O.B.E.	..	..	Calcutta
Sir Chintaman Deshmukh, Kt., C.I.E., I.C.S. (Retd.)			New Delhi
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Mr. E. P. Gee, M.A., C.M.Z.S.	..	..	Shillong
Dr. Baini Prashad, D.Sc., F.N.I.	..	..	Dehra Dun
Mr. P. D. Stracey, I.F.S.	..	..	Dehra Dun
Dr. M. L. Roonwal, M.Sc., Ph.D., F.N.I., F.Z.S.I.	..	..	Calcutta
Lt.-Gen. Sir H. Williams, C.B., C.B.E., M.I.C.E., M.I.E.			Roorkee

## HONORARY SECRETARY'S REPORT FOR THE YEAR 1959-60

At the last Annual General Meeting held on 31st August 1959 I presented a supplementary report up to that date. Except for the references to the *Journal* and the revenue account, this report deals with the period of one year since then.

## THE SOCIETY'S JOURNAL

Volume 56 of the *Journal*, publication of which was completed in the year under report, contained 34 articles and 84 miscellaneous notes. We have to express concern that it is becoming more and more difficult to obtain material relating to matters of natural history.

## GENERAL

The negotiations with the Central Government regarding a block grant for the construction of a building for the Society in the Prince of Wales Museum grounds in Bombay have not yet been finalized. Plans

have, however, been prepared. The building when completed will have over 14,000 sq. ft. of floor space including a lecture room (1160 sq. ft.), rooms for reference collections (6615 sq. ft.), and a laboratory and work room (1160 sq. ft.). The plans and estimates have been forwarded to the Ministry of Scientific Research & Cultural Affairs, and it is hoped to finalise negotiations and commence building at an early date.

The funds made available by the Rockefeller Foundation, referred to in the supplementary report last year, have been usefully expended. In addition to a second bird-banding project in Kutch, 18 grants to the extent of about Rs. 5700 were made for various problems, botanical and zoological ; some of the results will be published in our journal in due course.

The first bird migration camp in Kutch referred to in the last report was supplemented by a small grant from the World Health Organization. This made it possible to obtain the advice and assistance of Dr. A. Schifferli, Director of the Swiss Migration Centre at Sempach, who visited India particularly to assist in the field. A second camp was established at Kuar Bet on the borders of the Rann of Kutch for the spring migration. Subsequent to this the World Health Organization have made a grant of \$ 8000.00 to continue this work with a view to investigating the relationship between the movements of birds and the spread of virus diseases.

In my last report I referred to the indexing of the books in our library. This work has now been completed, and a grant from the Government of Maharashtra has enabled us to purchase a sufficient number of cabinets to hold all our books. 201 new books have been added to the library during 1959 and the current year up to 31st August. These include 74 purchased, 114 presented, and 13 received for review.

Over the same period about 500 birds and 100 reptiles and amphibians have been added to our collections. They include, among birds, the type of a newly described race, *Dumetia hyperythra navarroii*, several Finn's Bayas (*Ploceus megarhynchus*) whose re-discovery in the wild I referred to in my last report, and a pair of Godwin-Austen's Hornbills [*Ptilolaemus tickelli austeni* (Jerdon)]. The identified reptiles include specimens of the little known species *Barkudia insularis* of Annandale from Waltair, and *Platyurus platyurus* from Nepal, and the amphibians *Rana afghana*, tadpoles of *Megalophrys* sp. from Nepal, *Bufo andersoni* from Kutch, and *B. latastii* from Kashmir, which are all new additions to our collection. Other rarities and interesting specimens will no doubt be discovered when the collections have been more fully worked out.

With the funds made available by the State Government, orders have been placed for steel cabinets to house the birds and mammals in our collection. It is hoped that when these come in and the specimens

are suitably transferred to them, the large collections will be more easily accessible and more work will be done thereon.

During the year, Dr. (Miss) Rachel Reuben delivered an interesting talk on 'Insects and Weather' and Mr. Leslie Brown showed a coloured movie film accompanied by a talk on 'Eagles'.

#### PUBLICATIONS

Unfortunately, we have not been able to make much progress with the new editions of the Animal and Bird books. Work has been held up mainly by financial difficulties and we are negotiating with the Ministry of Scientific Research & Cultural Affairs for a grant in this connection. The text and pictures of both the books are ready and it is hoped that the negotiations will be completed shortly and that it will be possible to have them ready at an early date. Dr. Dillon Ripley's *A SYNOPSIS OF THE BIRDS OF INDIA AND PAKISTAN* is in the last stages of printing and we hope to publish it in a couple of months.

#### NATURE EDUCATION

The Nature Education Scheme, financed by the Government of Bombay, is now in its 12th year. Tours of the Natural History Section of the Prince of Wales Museum and special talks on natural history subjects with the aid of exhibited and other specimens, films, and some living animals were continued. Over 4500 children were lectured to.

Nine field-trips were arranged for members of Nature Study Clubs in schools, to different places in the island of Salsette and one to Nirmal Lake near Bassein. The trips are followed by meetings (44 held this year) at schools to help children to collect and preserve specimens and to discuss topics of natural history interest.

Two field-trips for teachers were arranged, one led by Fr. H. Santapau, S.J., to Tansa Lake to study the plants, and the other covering geology by Dr. R. N. Sukheshwala to Elephanta Island.

The fourth booklet *OUR MONSOON PLANTS* in the series 'Glimpses of Nature' was published. Though these booklets are available in English, Hindi, Marathi, and Gujarati and are very much appreciated by educationists, their sale is comparatively poor, and the stock in hand renders difficult the publication of additional numbers. The fifth, *OUR ANIMALS*, is almost ready and should be soon available.

A meeting of children to celebrate Wild Life Week was held on 7th October 1959, and some films were shown.

#### REVENUE ACCOUNT

In the last report I referred to a total membership of 1255 as at the end of 1958 and stated that 274 members had either not paid their subscriptions or could not be traced. Efforts were made to ascertain their whereabouts and, in the absence of any response, we had to remove

from the membership rolls the names of 328 members at the end of 1959, including 38 who resigned and 11 who died during the year. With the addition of 88 new members the register as at the end of 1959 showed a total membership of 1058. Efforts are being made to enrol more new members by the distribution of a brochure depicting the history and activities of the Society, which we have been able to produce with the funds made available by the grant received from the Rockefeller Foundation.

During the year under review the income of the Society rose to Rs. 57,657.40 as against Rs. 47,374.00 in the previous year. This was mainly due to a grant of Rs. 8000.00 having been received from the Government of India. During the year the Society ran out of stock of two of its most popular publications and this resulted in a drop in income from this source by approximately Rs. 2010.72 which we were largely able to make up from other sources of revenue.

The operations of the Society during 1959 showed a deficit of Rs. 2221.00 as against Rs. 11,448.00 in 1958. A promised recovery of Rs. 3155.00 from the Prince of Wales Museum in respect of half the salary of the Acting Curator, referred to in the last report, has now been made and has been adjusted towards last year's deficit of Rs. 11,448.00 thus reducing the deficit for that year to Rs. 8293.00. Had it been possible to secure the Government of India grant of Rs. 8000.00 in respect of 1958, the deficit would have been reduced to Rs. 293.00 only and attempts are still being made to secure this grant.

Expenses during the year amounted to Rs. 59,878.89, an increase of Rs. 1056.75 over the previous year. The increase is chiefly attributable to the cost of shifting the reference collection from the Museum to our premises and travelling expenses paid for interviewing candidates for the post of Curator, both non-recurring items of expenditure.

Of course, the appointment of a Curator will mean an additional expenditure of approximately Rs. 10,000.00 in 1961 but the Executive Committee is actively considering ways and means of increasing the Society's income to meet this expense.

#### STAFF

The Committee wishes to record its appreciation of the willing co-operation of the entire staff in the activities of the Society.

#### ACKNOWLEDGEMENTS

The Committee's thanks are due to Mr. J. L. Bernard who continues to look after the Society's interests in the United Kingdom.



# THE BOMBAY NATURAL HISTORY SOCIETY

## BALANCE SHEET AS AT 31 DECEMBER 1959

FUNDS AND LIABILITIES		Rs nP	Rs nP	ASSETS	Rs nP	Rs nP
<i>Trust Fund or Corpus:</i>				<i>Immovable Properties</i>		nil
<i>Life Membership Fund:</i>				<i>Investments: (At cost)</i>		
Balance as per last Balance Sheet		97,240.28		Rs. 14,000 4% Bombay Port Trust Bonds		10,780.00
Add: Amounts received during the year...		150.00		" 15,000 4% Bombay Improvement Trust Bonds		11,400.00
<i>Other Earmarked Funds:</i>			97,490.28	" 36,000 3% Funding Loan 1966-68		35,812.62
<i>Field Work Fund:</i>				" 25,000 3% Conversion Loan 1946		25,000.00
Balance as per last Balance Sheet		2,909.97		" 2,000 3% First Development Loan 1970-75		1,948.75
Less: Spent during the year...		950.00		<u>92,000</u>		84,941.37
<i>Expedition Fund</i>				(Market value Rs. 83,785)		6,133.34
<i>Wild Life Fund</i>				£ 460 3½% Defence Bonds		91,074.71
<i>Mammal Survey Fund:</i>			715.25	Less: Provision for Depreciation		3,750.00
Balance as per last Balance Sheet		3,265.73		<i>Furniture and Fixtures:</i>		
Less: Spent during the year ...		194.00		Balance as per last Balance Sheet		1,441.49
<i>Building Fund</i>				Less: Sold during the year		350.80
<i>Nature Education Trophy Fund</i>				Add: Addition during the year		1,090.69
<i>Reserve for Wall Snake Charis</i>				Less: Depreciation during the year		103.15
<i>Unspent Grant of Government of Bombay:</i>				Loans: (Secured)		1,193.84
Balance as per last Balance Sheet		33,515.43		Loan Scholarships	Good	145.68
Less: Spent up to 31.3.59		15,860.85		Other Loans	nil	
<i>Less: Spent for equipment &amp; Furniture after 31.3.59</i>				(to staff)	248.39	nil
16,654.58				Advances:		
480.29				To Trustees	...	nil
16,174.29				" Employees	...	nil
11,656.83				" Contractors	...	6,859.30
16,174.29				" Lawyers	...	nil
11,656.83				" Nature Education Scheme	...	965.64
16,174.29				" Others	...	121.29
11,656.83				<i>Income Outstanding:</i>		
16,174.29				Rent	...	nil
11,656.83				Interest (Accrued)	...	1,349.13
16,174.29				Other Income:		
11,656.83				Supplies and Services	...	10,700.72
16,174.29				Government of Bombay Grant	...	4,000.00
11,656.83				Carried forward		16,049.85
16,174.29						56,567.49



## BALANCE SHEET AS AT 31 DECEMBER 1959—(continued)

FUNDS AND LIABILITIES	Rs nP	ASSETS	Rs nP	Rs nP
Brought forward ...	1,66,368.26	Brought forward ...	16,049.85	96,567.49
<i>Unspent Grant from Rockefeller Foundation</i>				
<i>Liabilities:</i>				
For Expenses ...	27,443.53	Government of India Grant ...	8,000.00	
" Advances (Subscriptions) ...	1,359.71	Government of Bombay Special Grant ...	34,000.00	
" Sundry Credit Balances ...	4,540.38	Rockefeller Foundation Grant ...	2,845.11	
<i>Income and Expenditure Account</i>				
Balance as per last Balance Sheet ...	26,650.69	<i>Stock of Books on hand: (At cost or under)</i>		60,894.96
Add: Refund of Mr. V. K. Chari's salary in respect of 1958 ...	3,155.63	As certified by the Honorary Secretary ...		54,028.17
<i>Less: Deficit as per Income and Expenditure Account ...</i>	<i>29,806.32</i>	<i>Cash and Bank Balances:</i>		
	<i>2,221.49</i>	(a) <i>In Current Account with:</i>		
		National and Grindlays Bank Ltd., Bombay ...	8,215.92	
		National and Grindlays Bank Ltd., London ...	8,494.59	
		Fixed Deposit with the Comptoir National d'Escompte de Paris, ...	30,000.00	
		(b) With the Trustee ...		
		(c) With the Cashier ...	550.00	
Total ...	27,584.83			47,260.51
		Total ...		2,58,751.13

The above Balance Sheet to the best of my belief contains a true account of the Funds and Liabilities and of the Properties and Assets of the Trust.

As per our report of even date,  
(Sd.) A. F. FERGUSON & CO.,  
Chartered Accountants

(Sd.) (Fr.) H. SANTAPAU,  
Trustee.

BOMBAY, 10th May, 1960.

# THE BOMBAY NATURAL HISTORY SOCIETY

## SEPARATE ACCOUNTS

### 1. GOVERNMENT OF BOMBAY SPECIAL GRANT ACCOUNT EXPIRING ON 31.3.1960

Cr.	Rs nP	Dr.	Rs nP
To Rent for 9 months from 1.4.59 to 31.12.59	...	By Grant for 1959-60	...
" Salaries from 1.4.59 to 31.12.59	15,750.00		...
" Miscellaneous expenses from 1.4.59 to 31.12.59	6,447.61		...
" Balance unspent transferred to Balance Sheet	145.56		...
	11,656.83		...
Total	34,000.00		34,000.00

### 2. ROCKEFELLER FOUNDATION GRANT FOR 1959-60

Cr.	Rs nP	Dr.	Rs nP
To Contribution to B. N. H. S. Library for book-binding	...	By Grant (\$10,000)	...
" Contribution to B.N.H.S. Library for purchase of new books	3,332.20		...
" Bird Migration study expenses at Kutch	1,800.00		...
" Field grants to various members	8,102.68		...
" Balance unspent transferred to Balance Sheet	2,310.70		...
	31,454.42		...
Total	47,000.00		47,000.00

### 3. WORLD HEALTH ORGANISATION GRANT

Cr.	Rs nP	Dr.	Rs nP
To Bird Migration study survey expenses at Kutch	...	By Grant (\$1,000)	...
	4,718.79		...
Total	4,718.79		4,718.79

4. LIBRARY ACCOUNT			
Cr.	Rs nP	Dr.	Rs nP
To Purchase of New Books ...	2,701.36	By contribution from Rockefeller Foundation Grant Account No. 2 ...	5,132.20
" Subscription to other Societies ...	677.81	" Miscellaneous receipts ...	700.54
" Book binding expenses ...	3,332.20	" Transferred to Income and Expenditure Account ...	878.63
Total ...	6,711.37	Total ...	6,711.37
5. JOURNAL ACCOUNT			
Cr.	Rs nP	Dr.	Rs nP
To Cost of printing Journal ...	17,209.11	By Grant from the Government of India ...	8,000.09
		" Transferred to Income and Expenditure Account ...	9,209.11
Total ...	17,209.11	Total ...	17,209.11
6. PUBLICATION ACCOUNT			
Cr.	Rs nP	Dr.	Rs nP
To opening stock on 1.1.1959 ...	53,411.16	By Sales during the year ...	35,255.24
" Additions during the year ...	20,673.00	" Closing stock on 31.12.1959 ...	54,028.17
Royalties to Authors ...	74,084.16		
" Transferred to Income and Expenditure Account ...	2,451.61		
	12,747.64		
Total ...	89,283.41	Total ...	89,283.41
7. MISCELLANEOUS ACCOUNT			
Cr.	Rs nP	Dr.	Rs nP
To Expenses for shifting reference collections from Museum to Society's premises ...	1,190.97	By Transferred to Income and Expenditure Account ...	1,943.45
" Travelling expenses for interviewing candidates for Curator's post ...	552.13		
" Contributions to Scientific Organisations ...	200.35		
Total ...	1,943.45	Total ...	1,943.45

# 8. ESTABLISHMENT ACCOUNT

	Rs nP	Dr.	Rs nP
To Salaries including Dearness Allowance	21,774.80		
" Contribution to Staff Provident Fund	1,362.48	By Transferred to Income and Expenditure Account ...	34,014.96
" Postage	1,549.53		
" Printing and Stationery	1,178.33		
" Advertisement	123.97		
" Editors' travelling allowance	1,050.00		
" Travelling allowance to Honorary Secretary	3,600.20		
" Telephone call charges	461.42		
" Bank charges	251.42		
" Audit Fees	512.85		
" Fire Insurance	157.32		
" Depreciation on Furniture	145.68		
" Field travelling expenses	47.88		
" General charges	1,799.28		
Total	34,014.96	Total	34,014.96

# INCOME AND EXPENDITURE ACCOUNT

	Rs nP	Dr.	Rs nP
To Journal Account No. 5	9,209.11	By Publication Account No. 6	12,747.64
" Library Account No. 4	878.63	" Grant from the Government of Bombay	4,000.00
" Miscellaneous Account No. 7	1,943.45	" Membership Fees	21,573.15
" Establishment Account No. 8	34,014.96	" Entrance Fees	440.00
		" Interest on Investments	5,019.86
		" Commission on taxidermy work	44.01
		" Deficit transferred to Balance Sheet	2,221.49
Total	46,046.15	Total	46,046.15

# THE BOMBAY NATURAL HISTORY SOCIETY

## NATURE EDUCATION SCHEME

## RECEIPTS

To Bank Balance on 1.1.1959	...	Rs nP
" Government of Bombay Grant for 1958-59	...	1,088.75
" Government of Bombay Grant <i>re</i> increment in salary	...	6,100.00
" Sales of Booklet No. I	...	1,080.00
" Sales of Booklet No. II	...	332.55
" Sales of Booklet No. III	...	379.58
" Sales of Booklet No. IV	...	525.56
" Sales of line drawings	...	259.95
" Loan from Bombay Natural History Society	...	32.36
		965.64

Total ... 10,764.39

## PAYMENTS

By Re-payment of loan from Bombay Natural History Society	...	Rs nP
" Salary of Nature Education Organiser	...	2,004.11
" Postages	...	5,875.00
" Cost of Printing Line drawings	...	72.25
" Cost of Booklet No. II	...	25.20
" General charges	...	70.00
" Printing and stationery	...	392.23
" Cost of Booklet No. III	...	114.44
" Cost of Booklet No. IV	...	1,057.10
" Cash on hand with the cashier	...	1,071.55
" Bank balance on 31 December, 1959	...	50.00
		32.51

Total ... 10,764.39

(Sd.) A. F. FERGUSON & Co.,  
Chartered Accountants

BOMBAY, 10th May, 1960.



MINUTES OF THE ANNUAL GENERAL MEETING OF THE  
BOMBAY NATURAL HISTORY SOCIETY HELD IN THE  
DURBAR (TOWN) HALL, BOMBAY, ON WEDNESDAY,  
12TH OCTOBER 1960, AT 6 P.M., WITH REV. FR. H.  
SANTAPAU, S.J., IN THE CHAIR

1. The Honorary Secretary's Report for the years 1959-60, having been circulated among members prior to the meeting, was taken as read, and was adopted.

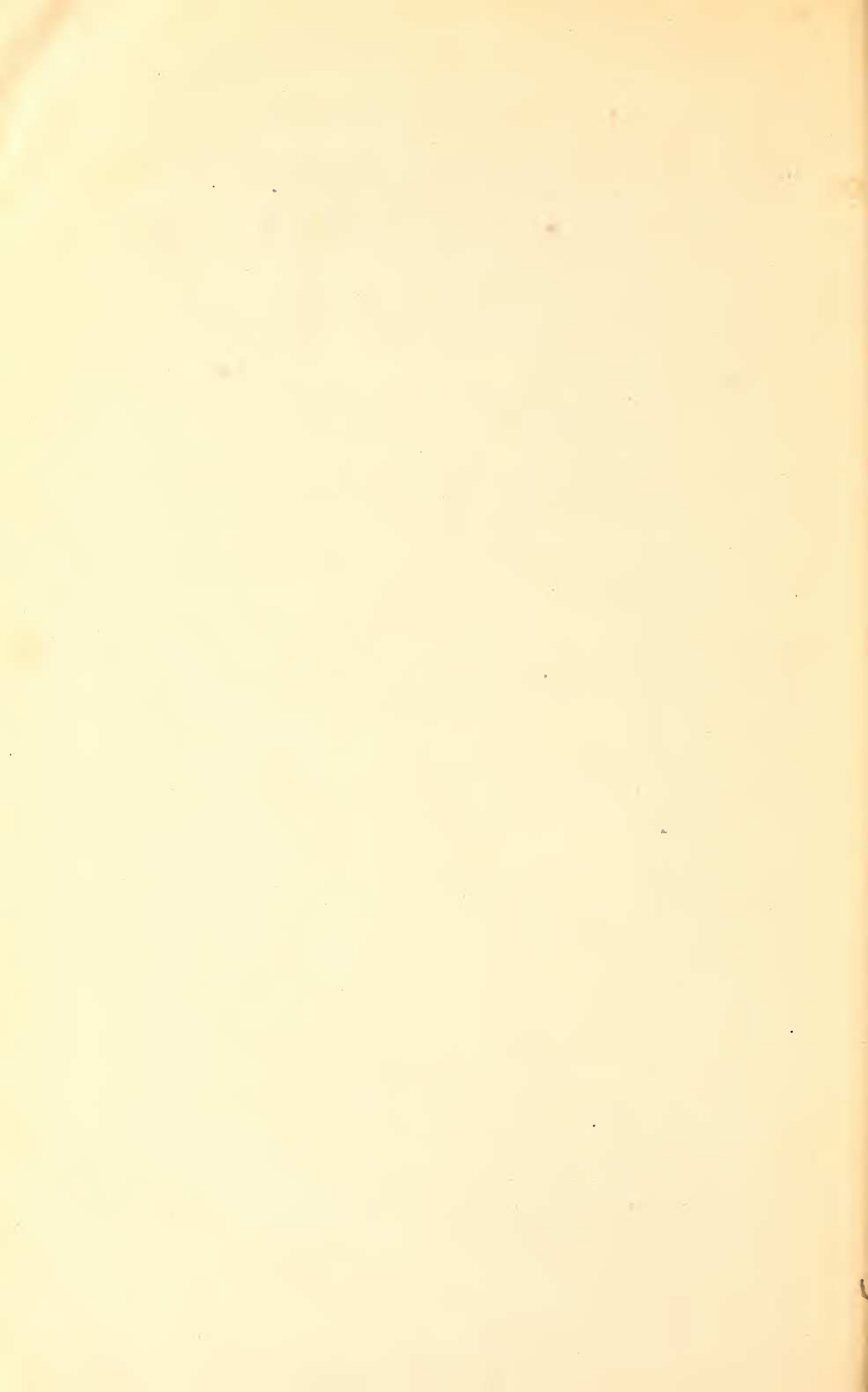
2. The Balance Sheet and Statement of Accounts presented by the Honorary Treasurer were approved.

3. The Chairman referred to the recent death of Dr. S. P. Agharkar who was a member of the Society for many years and served on the Executive Committee from 1954 to the date of his death.

A resolution of condolence, to be conveyed to Mrs. S. P. Agharkar, was adopted with all members standing.

4. Dr. Sálím Ali then delivered a talk illustrated by a film on the Bird Migration Studies which are being carried out with funds made available by the World Health Organisation and in collaboration with the Virus Research Centre, Poona. The talk and the film were greatly appreciated.

5. The meeting terminated with a vote of thanks to Dr. Sálím Ali for his talk, to the Asiatic Society for the loan of the premises, and to the Chairman of the meeting.



## THE SOCIETY'S PUBLICATIONS

### Mammals

**The Book of Indian Animals**, by S. H. Prater. With many coloured and monochrome plates. 2nd (revised) edition. *(In preparation)*

### Birds

**Game Birds of India**, by E. C. Stuart Baker. Vol. III. Pheasants, 1st Edition. **Rs. 20**  
*(Price to Members Rs. 15)*

**The Book of Indian Birds**, by Sálim Ali. With 64 coloured and many monochrome plates, 6th edition, revised and enlarged. *(In preparation)*

### Fishes

**Circumventing the Mahseer and Other Sporting Fish in India and Burma**, by A. St. J. Macdonald. With coloured and monochrome plates. **Rs. 15**  
*(Price to Members Rs. 12)*

### Snakes

**Identification of Poisonous Snakes.** Wall chart in English, Gujarati, and Marathi. **Rs. 10**  
*(Price to Members Rs. 8)*

### Miscellaneous

**Some Beautiful Indian Trees**, by Blatter and Millard. With many coloured and monochrome plates. 2nd edition. Revised by W. T. Stearn. **Rs. 20**  
*(Price to Members Rs. 16)*

**Some Beautiful Indian Climbers and Shrubs**, by Bor and Raizada. With many coloured and monochrome plates. **Rs. 22**  
*(Price to Members Rs. 17.50)*

**Butterflies of the Indian Region**, by M. A. Wynter-Blyth. With 27 coloured and 45 monochrome plates. **Rs. 28**  
*(Price to Members Rs. 22.50)*

**Indian Molluscs**, by James Hornell. With 2 coloured and many monochrome plates, and text figures. **Rs. 6**  
*(Price to Members Rs. 4.50)*

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The Society will gratefully accept back numbers of the Journal, particularly numbers prior to Vol. 45, from members who may not wish to preserve them.

### TERMS OF MEMBERSHIP

**Life Members** pay an entrance fee of Rs. 5 and a life membership fee of Rs. 500.

**Ordinary Members** pay an entrance fee of Rs. 5 and an annual subscription of Rs. 30.

The subscription of members elected in October, November, and December covers the period from the date of their election to the end of the following year.

### MEMBERS RESIDING OUTSIDE INDIA

The terms are the same for members living outside India. Such members should pay their subscriptions by means of orders on their Bankers to pay the amount of the subscription, plus postage—in all Rs. 32.50—to the Society in Bombay on the 1st January in each year. If this cannot be done, then the sum of £2-10-0 should be paid annually to the Society's London bankers—The National & Grindlays Bank Ltd., 26 Bishopsgate Street, London, E.C. 2.

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